



CLAIMS

What is claimed is:

1. A battery, comprising an anode in electrical communication with a cathode, a separator that separates said anode and said cathode, a means for electrical communication between said anode and said cathode, wherein said anode is comprised of carbon nanotubes and has been lithiated in advance of battery fabrication and said cathode is comprised of carbon nanotubes.
2. The battery of claim 1, wherein said carbon nanotube is selected from the group consisting of multi-walled nanotubes, single-walled nanotubes, nanohorns, nanobells, peapods, buckyballs and a combination thereof.
3. The battery of claim 2, wherein said carbon nanotube comprises single-walled nanotubes.
4. The battery of claim 3, wherein said single-walled nanotube is charged up to Li_1C_3 .
5. The battery of claim 1, wherein said separator comprises a lithium salt electrolyte.
6. The battery of claim 1, wherein said carbon nanotube has a reversible capacity in excess of 600 mAh/g.
7. The battery of claim 1, wherein said carbon nanotube alkali saturation is MC_8 , wherein M is selected from the group consisting of K, Rb, and Cs.
8. The battery of claim 1, wherein said carbon nanotubes are lithiated.

9. The battery of claim 1, wherein said anode is a LiC_3 anode.
10. The battery of claim 1, wherein said cathode is comprised of single-walled nanotubes, and wherein said anode is comprised of multi-walled nanotubes.
11. The battery of claim 11, wherein said multi-walled nanotubes are lithiated.
12. The battery of claim 11, wherein said single-walled nanotubes are essentially pure nanotube material.
13. The battery of claim 1, wherein said anode comprises lithiated single-walled nanotubes, and wherein said cathode comprises single-walled nanotubes doped in a lithium metal oxide.
14. The battery of claim 14, wherein said lithium metal oxide is LiNiCoO_2 .
15. The battery of claim 1, wherein said anode comprises single-walled nanotubes, and wherein said single-walled nanotubes have been treat with a gas selected from the group consisting of CO_2 , CO , NO_2 , NO , N_2O , O_2 , peroxides, O_3 , SO_2 , and CH_2CO .
16. The battery of claim 1, wherein said anode comprises lithiated single-walled nanotubes, and wherein said cathode comprises fluorinated single-walled nanotubes.
17. The battery of claim 1, wherein said anode comprises lithiated multi-walled nanotube buckypaper, and wherein said cathode comprises single-walled nanotube buckypaper.
18. The battery of claim 1, wherein said anode comprises a conducting polymer-doped single-walled nanotubes, and wherein said cathode comprises of essentially pure single-walled nanotubes.

19. The battery of claim 1, wherein said anode comprises single-walled nanotubes, and wherein said cathode comprises LiNiCoO_2 .

20. The battery of claim 1, wherein said electrolyte is a nonflammable polyether phosphate liquid together with a lithium salt.

21. The battery of claim 1, wherein said anode comprises a lithium composite, and wherein said cathode comprises essentially pure single-walled nanotube material.

22. The battery of claim 22, wherein said lithium composite is LiSiC .

23. A battery as in claim 1 in which the negative electrode (anode) is prelithiated chemically or electrochemically using suitable lithiating agents such as n-butyl lithium, lithium metal or lithium metal oxides.

24 The battery of claim 5, wherein said electrolyte is comprised of a lithium salt and a liquid polyether phosphate or polyether phosphonate or an alkyl phosphate or phosphonate.

25. The battery of claim 5, wherein said electrolyte is comprised of a lithium salt and a liquid alkyl carbonate.